Percent Natural Land Cover

This EnviroAtlas national map portrays the percentage of land area within each 12-digit hydrologic unit (HUC) that is classified as natural land cover in the EnviroAtlas hybrid 2011 Cropland Data Layer (CDL) - 2011 National Land Cover Dataset (NLCD).

Why is natural land cover important?

The 16 land cover classes in the NLCD provide a generalized view of national land cover that is useful for national and regional land management, climate change research, and environmental assessments. EnviroAtlas defines natural land cover as forest, shrubland, grassland, barren land, and wetland cover classes, and it excludes agriculture and developed land. The term *natural* in natural land cover does not imply good quality or lack of human disturbance but rather vegetative cover that is not typically intensively managed. For example, natural land cover includes range but not pasture, which is included under agriculture. In EnviroAtlas, the most evident patterns of percent natural land cover can be seen in the highly cultivated Midwest, where there is a low percentage of natural land cover, in contrast to greater than 90% natural land cover in most of the West.

Natural land cover provides a context for environmental assessments by characterizing the climate, ecosystem types, and associated habitats of an area of interest. For example, shrubland land cover in the Great Basin indicates a semi-arid climate, with about 13 inches/year of precipitation falling mainly in the winter and early spring. Great Basin sagebrush habitats also support an associated group of plant and animal species. Natural land cover data at various scales are essential attributes of habitat suitability and species distribution models. The U.S. Geological Survey GAP Analysis program uses natural land cover data and other key habitat parameters from the literature to model vertebrate species distributions for biodiversity assessment and conservation planning.[1, 2]

Studies designed to detect and interpret land cover changes over time examine aspects of climate change, habitat loss, and patterns of urban growth. Recent research in Florida demonstrated that simply changing the land cover classes in atmospheric models from pre-1900 natural land cover to late 20th century post-development land cover revealed altered sea breeze circulation patterns and reduced summer rainfall totals, confirming recent observations.[3]

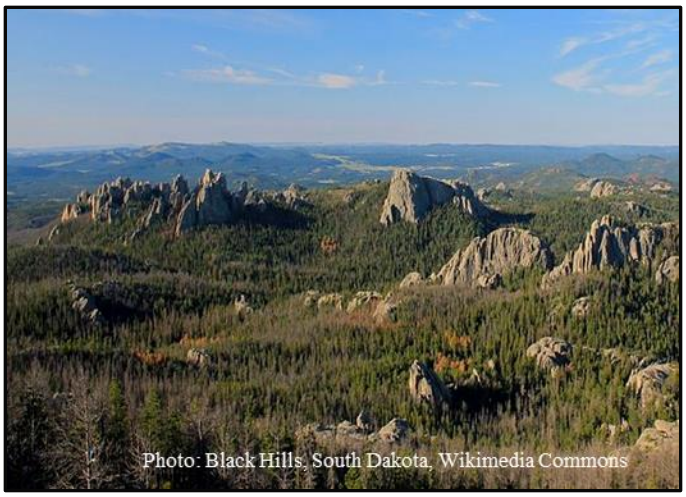

Photo: Black Hills, South Dakota, Wikimedia Commons

Regional land cover change detection is a valuable tool to focus planning and conservation efforts. Monitoring past changes in natural land cover may suggest future changes in management focus that better protect the resource. For example, a Great Lakes study found that a higher than expected area of near-lake wetlands had been lost to development in the 1990s, even during a time of heightened awareness of wetland values, suggesting that greater effort may be needed in the future to protect shoreline wetlands.[4]

The amount of natural land cover in a watershed affects both terrestrial and aquatic habitat quality. In a stream study conducted in coastal Maryland streams, aquatic insect assemblage composition changed significantly (i.e., sensitive species were lost) when between 21% and 32% of whole watershed natural land cover was developed.[5] The same study found that the thresholds for assemblage changes were even lower when development occurred closer to the stream.

Natural land cover adjacent to streams and rivers, sometimes called the riparian area (or riparian buffer), helps protect terrestrial wildlife habitat, aquatic habitat, and water quality especially in agricultural or urbanized areas where upland natural land cover may be lacking. For more information on riparian cover, see EnviroAtlas national and community data layers covering stream and lake buffers.

How can I use this information?

This map is one of a series of EnviroAtlas data layers that depict national land cover. The map estimates the percent land area of 12-digit HUCs covered by natural land cover

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(forest, shrubland, grassland, barren land, and wetlands) and excludes developed agriculture and urban land. Continuous nationwide land cover data allows the assessment of national and regional environmental issues. Land cover, together with other EnviroAtlas data, can be used to estimate risks from natural hazards and to prioritize areas for conservation.[6]

For example, the natural land cover map may be compared with maps depicting protected status (PADUS, GAP, or IUCN) to assess the distribution of existing protected areas and the need for additional protected lands in the remaining areas of natural land cover. Natural land cover may also be associated with major stressors such as national patterns of impervious area or nutrient sources such as manure or nitrogen fertilizer application.

How were these data created?

These data were generated by using an EnviroAtlas hybrid 2011 Cropland Data Layer (CDL) - 2011 National Land Cover Dataset (NLCD) in the landscape assessment tool, Analytical Tools Interface for Landscape Assessments (ATtILA). ATtILA is an Esri ArcView extension created by EPA that calculates many commonly-used landscape metrics. NLCD classes 31 Barren, 41 Deciduous, 42 Evergreen, 43 Mixed Forest, 52 Shrub/Scrub, 71 Grassland/Herbaceous, 90 Woody Wetlands, and 95 Emergent Herbaceous Wetlands were used for this map. The landcover data were summarized by 12-digit HUC boundaries taken from the Watershed Boundary Dataset (WBD). For more information on the metric calculation, see the ATtILA User's Manual.

What are the limitations of these data?

Though EnviroAtlas uses the best data available, there are limitations associated with the data. The landcover classes found in NLCD are created through the classification of 30 meter resolution satellite imagery. Human classification of landcover types that have a similar spectral signature can result in classification errors. As a result, NLCD is a best estimate of actual landcover. Periodic updates to EnviroAtlas will reflect improvements to nationally available data. Each version of NLCD is released several years after the date of the satellite imagery, meaning that the land cover patterns are several years out of date when released. Accuracy information for the NLCD can be found on its website.

How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded. The NLCD, CDL, and WBD data are accessible through their respective websites. NLCD data are updated every 5 years to enable change detection research; a land cover change data layer is also available that contains only the pixels identified as changed during the ten year interval from 2001 to 2011.

Where can I get more information?

A selection of resources related to the utility of natural land cover data is listed below. For additional information on how the data were created, access the metadata for the data layer from the drop down menu on the interactive map table of contents and click again on metadata at the bottom of the metadata summary page for more details. To ask specific questions about this data layer, please contact the EnviroAtlas Team.

Acknowledgments

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Selected Publications

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